

What is claimed is:

1. A mass spectrometer system for mass analysis of a sample to be measured, by ionizing the sample, comprising: a first ion source for ionizing the sample; a second ion source for producing ions of a polarity reversed from that of the ions produced in said first ion source; an ion deflector for introducing and deflecting the ions of said first and second ion sources; an ion-trap mass spectrometer including a ring electrode and a pair of endcap electrodes; and a detector for detecting the ions ejected from said mass spectrometer, wherein:

the ions from said first and second ion sources are introduced together through said ion deflector into said ion-trap mass spectrometer; the ions from the two ion sources are mixed in said ion-trap mass spectrometer; and the ions are then detected in said detector.

2. A mass spectrometer system in Claim 1, wherein said ion deflector is an electrostatic quadrupole deflector including four electrodes.

3. A mass spectrometer system in Claim 1, which further comprises electrodes interposed between said first ion source and said ion deflector and between said second ion source and said ion deflector for blocking or accelerating, when fed with voltages, the flow of the ions from the ion sources.

4. A mass spectrometer system in Claim 1, which further comprises: a third ion source for ionizing the sample to be

measured; a fourth ion source for producing ions of a polarity reversed from that of the ions produced in said third ion source; and a second ion deflector for introducing and deflecting the ions coming from said third and fourth ion sources; wherein said second ion deflector is arranged between said ion-trap mass spectrometer and the detector.

5. A mass spectrometer system for mass analysis of a sample to be measured, by ionizing the sample, comprising: a first ion source for ionizing the sample; a second ion source for producing ions of a polarity reversed from that of the ions produced in said first ion source; an ion deflector for introducing and deflecting the ions of said first and second ion sources; a mass spectrometer for mass analysis of the ions; and a detector for detecting the ions ejected from said mass spectrometer, wherein

the ions coming from said first and second ion sources are mixed between said first and second ion sources and said mass spectrometer; and in that the mixed ions are then introduced for the mass spectrometry into said mass spectrometer.

6. A mass spectrometer system in Claim 5, which further comprises: an rf multipole ion guide arranged at a position to pass the ions from said ion deflector; wherein

the ions from said first and second ion sources are introduced together through said ion deflector into said rf multipole ion guide; in that the ions from the two ion sources

are mixed in said rf multipole ion guide; and in that the ions are then introduced for the mass analysis into said mass spectrometer.

7. A mass spectrometer system in Claim 6, wherein said rf multipole ion guide is arranged in a cylindrical casing; and in that said casing is fed with a buffer gas.

8. A mass spectrometer system in Claim 5, wherein said first and second ion sources introduce the ions simultaneously into said ion deflector.

9. A mass spectrometer system in Claim 5, wherein said mass spectrometer is any of a quadrupole mass spectrometer, a time-of-flight mass spectrometer, a triple quadrupole mass spectrometer and a magnetic sector-type mass spectrometer.

10. A mass spectrometer system in Claim 5, which further comprises: a quadrupole mass spectrometer for the mass analysis of the ions coming from said first ion source; and a second rf multipole ion guide for producing the product ions of the ions ejected from said quadrupole mass spectrometer; wherein

said quadrupole mass spectrometer and said second rf multipole ion guide are arranged between said first ion source and said ion deflector.

11. A mass spectrometer system in Claim 5, which further comprises lens electrodes between said first ion source and said ion deflector and between said second ion source and said ion

deflector, for controlling, when fed with voltages, the quantities of ions to pass.

12. A mass spectrometer system for mass analysis of a sample to be measured, by ionizing the sample, comprising:

a first ion source for ionizing the sample;

a second ion source for producing ions of a polarity reversed from that of the ions produced in said first ion source;

a quadrupole mass spectrometer for the mass analysis of the ions coming from said first ion source;

an rf multipole ion guide for producing product ions of the ions ejected from said quadrupole mass spectrometer;

an ion deflector for introducing and deflecting the ions coming from said rf multipole ion guide and said second ion sources;

a mass spectrometer for the mass analysis of the ions ejected from said ion deflector; and

a detector for detecting the ions ejected from said mass spectrometer, wherein

the ions from said first ion source and the ions from said second ion source are caused to collide in said rf multipole ion guide.

13. A mass spectrometer system in Claim 12, wherein

said first ion source, said quadrupole mass spectrometer, said rf multipole ion guide and said ion deflector are arranged on a common axis;

said second ion source, said ion deflector and said mass spectrometer are arranged on a common axis; and

the axis containing said first ion source and the axis containing said second ion source are arranged at a right angle with respect to each other.

14. A mass spectrometer system in Claim 12, wherein said rf multipole ion guide includes a first region for producing product ions of the ions coming from said first ion source and a second region for causing said product ions and the ions coming from said second ion source to collide against each other.

15. A mass spectrometer system in Claim 12, wherein said mass spectrometer is a quadrupole mass spectrometer or a time-of-flight mass spectrometer.

16. A mass spectrometer system in any of Claim 1, 5 and 12, wherein

the solution to be fed to said second ion source contains polyethylene glycol (PEG) or polypropylene glycol (PPG) as a chemical compound.

17. A mass spectrometer system in any of Claim 1, 5 and 12, wherein

there is arranged upstream of said detector an electrode, to which a voltage of the same polarity as that of the ions produced in said second ion source is applied.

18. A mass spectrometry method comprising:

producing sample ions by ionizing a sample to be measured;
producing reactant ions of a polarity reversed from that
of said sample ions;

introducing said sample ions and said reactant ions, while
being discriminated in time series, into an ion-trap mass
spectrometer including a ring electrode and a pair of endcap
electrodes, through apertures formed in said endcap electrodes;
and

causing said sample ions and said reactant ions to react
in said ion-trap mass spectrometer thereby to perform the mass
analysis of the ions having reacted.

19. A mass spectrometry method comprising:

producing sample ions by ionizing a sample to be measured;
producing reactant ions of a polarity reversed from that
of said sample ions;

mixing said sample ions and said reactant ions; and

introducing the mixed ions into a mass spectrometer for
the mass analysis.